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Combat Crew

Strategic Air Command

September 1984



Lt Gen George D. Miller
Vice Commander in Chief, SAC

Since this is my last opportunity before I retire to communicate with the crew force, I find it difficult to refrain from pontificating about the good old days. Instead, I will save that for hangar flying at Daedalean meetings. Perhaps you would just help me pack up my personal equipment.

I have been shipping one of those standard GI footlockers, known affectionately as "the box," around the world for years, and in it are personal equipment items and "stuff" I have not used in a long time. I have always been amazed at the footlocker itself which is as heavy empty as cast iron but more durable. It is built like an ammunition box. They sure don't make them like that anymore.

Inside there is a wooden tray which I have always used for storage of miscellaneous items like a plastic bag full

R & R (Reflections & Reveries)

of old insignia, brown bars to glistening stars — they are all there. I was always kind of envious of those who had insignia passed on to them by fathers or relatives who had preceded them in the commissioned ranks. Now I will be proud to pass these on to my son. Mixed in with all this I found my "crash" wings . . . guess they are still known as that. The wings were given to me when I graduated from pilot training in 1954. Most refused to wear them, claiming they were bad luck. They were the only "slick" wings I wore . . . not in defiance, but because I was so proud to have won them. To me they represented not how I had conquered the air but how I had conquered myself . . . how I had been able to realize a dream that had always seemed unattainable. I was a pilot in the United States Air Force.

Here is a spiral notebook which I had to write for my instructor in primary flying school . . . "How to Fly the T-6." Seemed sort of silly at the time but in retrospect it made a lot of sense. It probably contains everything I knew about flying at that time. Here is a real gem. If you have to make a forced landing in a farm field look at the cows to determine which way the wind is blowing . . . they usually stand with their tails into the wind. It had never occurred to most of my classmates that cows made good weather vanes. A thoughtful instructor saved this notebook to return to me when I first became a general officer.

A thin line headset. I think I spent the week's grocery money to buy this, but \$20 was not too much to spend to

look professional. Besides, a six or seven hour gooney bird flight with your head in the vise grip of the issue headset was intolerable.

Right under that is a list of additional duties for which I was responsible in my first squadron: squadron training officer, squadron adjutant and assistant maintenance officer. Of course the adjutant ran all the fund drives and planned the squadron parties, as well. That all took a lot of my time considering I was TDY more than half of each year. What a wealth of training I got, though, in preparation for the career I chose. Makes me wonder when I hear complaints about additional duties.

A plastic soap container. Made a great personal survival kit to supplement the one fastened to my chute. Amazing how many small, useful things can be stuffed into the container. It was always in my pocket when I flew.

A silver aiguillete . . . the badge of office for an aide. How did I get selected for this job? I don't know — nor did I have much time to concern myself with it. I was too busy trying to be the best "recce" pilot in Europe at the time. As it turned out, another incomparable learning experience.

Some old AFIT papers from graduate school with encouraging notes from my math instructor like . . . "You are the only one in the class who still does not understand what a basis is." Little did he know I had just discovered that set theory did not pertain to tennis. But there, underneath, was my thesis on experimental flight test. Some of

Combat Crew

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ON OUR COVER

A newly-minted KC-135R refuels a C-5 transport. SAC accepted delivery of the first CFM-56 reengined KC-135R in early July. For more about this historic occasion see pg 12

it must have rubbed off. The practical use rather than the philosophy of math was more my bag.

Two short pieces of ribbon — one black and one red. The mark of Zorro, my A-1 squadron in Southeast Asia. We fastened these bits of ribbon to our helmets, sort of the scarf in the wind, for unit identification and a mark of team pride. I'll never forget my feelings when some P.E. NCO took it upon himself to cover the scars and camouflage paint on my helmet with gleaming white when I returned stateside. It was almost as if the Air Force was trying to forget that war as quickly as possible. While I resented this, neither paint nor time could ever blur my memory of our desperate attempt to save two countries, South Vietnam and Laos, from communist takeover. The utter shock of seeing my wingman go down in flames, the disbelief of a jolly green I was escorting blown out of the sky by a MIG are searing memories. Oh, and here is a chunk of metal which was a bullet from an antiaircraft weapon dug out of the headrest of my airplane — old 370, "The Flying Dutchman" — by my crew chief. Only the Lord knows why I was bent over changing fuel tanks when it shattered my windshield. Somebody does look out for us.

The good times are in this box, too. Here is my party suit complete with The Flying Dutchman emblazoned on the back. The mud from frolicking in the Animal Bar in the basement of the O'Club is all gone now. We fought hard and played hard. Live today for tomorrow . . . and for many there were no tomorrows.

What is this . . . my name tag from National War College. This was another case of "how did I get here?" These guys are all so bright . . . how can I ever compete with them? What a luxury it was to arrive hours before class was to begin, read the morning

paper in the Harry Hill Library, and watch the sun rise on the Potomac. I am truly alive and thankful for it. A few pamphlets from India, Israel, Saudi Arabia, Iran, and Lebanon . . . I went on the Mideast tour. What an opportunity that was to see those countries and hear directly from the leaders what their views of the world were. King Faisal told us in 1971 of the oil crisis which would occur in 73 (and did) as a result of our Middle East policy. I guess the State Department people who accompanied us were not listening.

A 55th Strategic Reconnaissance Wing patch. What misgivings I had about coming to SAC . . . first assignment as an ADO. I figured it would not take them long to figure out this fighter pilot did not belong here, and I would be looking for a new job. I had always suspected that this was a professional command but little did I realize that this was exactly where I fit in and what I had been looking for. You bet it is professional, the most professional in the world. It did not take me long to realize that the freedom of this nation and perhaps the future of mankind hinges on how well we do our jobs. Every detail counts. Speaking of details, here is a handwritten note from my Division Commander written while flying the Looking Glass telling me in explicit terms what a lousy commander I was because the windshield was dirty when he took off and the rubber edging was missing from his console table. He was right — details count.

A letter from Dr. Manas of the Jitapawan College at Pattaya Beach Thailand thanking me for the support I gave him while I was 17th Air Division Commander at U-Tapao. In spite of dirty windshields I had somehow become a general officer. For the B-52's the war was over and we were readying them to send home.

A newspaper clipping "New General Arrives at Minot." Another "opportunity." Jerked out of the tropical climes of Thailand in January 1975 to open the 57th Air Division at Minot. Somewhere along the line the difficulties of life on the Northern Tier had become obscured. Only when a group of uniformed dissidents took over the mess hall were we reminded that the Northern Tier is different and deserving of some special attention.

Three AKSARBEN pins to remind me of a tour at SAC Headquarters as DDO and XO. What a sobering experience to be the SAC war planner. It all comes together in the underground at SAC. God forbid that we ever have to carry out those plans, but they better be right if we do.

A JCS badge worn as Air Force Director of Plans. It reflects hours and days spent in the Gold Room, known as the Tank, haggling over service issues. Maybe the structure of the JCS is not quite right, but the people who serve in it will make any structure work. Sure each represents his service in the best possible light . . . an officer would not be worth his salt if he did not. But these are honest, sincere, patriotic Americans who are driven to make the best possible decisions for national defense rather than their service.

Another AKSARBEN pin — back home, back to SAC. I am privileged to serve as Vice Commander-in-Chief of this magnificent command.

It is time to close this foot locker which contains so much of my life. It does not close easily. I don't see the latches well through misty eyes. The memories in the box are locked within my heart. While I regret leaving active duty, I have no regrets about my career. It has been a good, rewarding and satisfying life. It has been fun. Hopefully I have been able to add just a little to your foot locker of memories . . . you have added to mine.★★★

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Applying Aerodynamics to Landing the

Understanding aerodynamics can make us better, safer pilots. The purpose of this article is to provide pilots with one view of how aerodynamic principles can be applied to landing the KC-135. Since many people agree that the key to a successful landing is a successful approach, we shall study the subject of landing the KC-135 by first addressing the aerodynamic principles involved during final approach and then turn to the principles that specifically apply to the landing.

In flying an approach in the KC-135 keep in mind that the airplane was designed to fly high and fast, neither of which is conducive to simple approaches or nice, smooth landings. We must tame our size and speed, our jet engines, and our high performance wing to make them amiable to the low altitude, low speed environment.

Because of our aircraft's poor performance at low speeds, and despite the various high lift devices, we must still fly our approaches at fairly high speeds. When we think of the KC-135, therefore, we must think of momentum — the product of mass and velocity. The tanker typically has over 30 times as much momentum as the pilot training aircraft we learned to fly, and about six times as much as a typical propeller-driven transport. Because of our large mass and high speeds, we must be very attentive on approaches. Our momentum makes any deviations that occur bigger and harder to correct. This is stated precisely by D. P. Davis in his book, **Handling the Big Jets:**

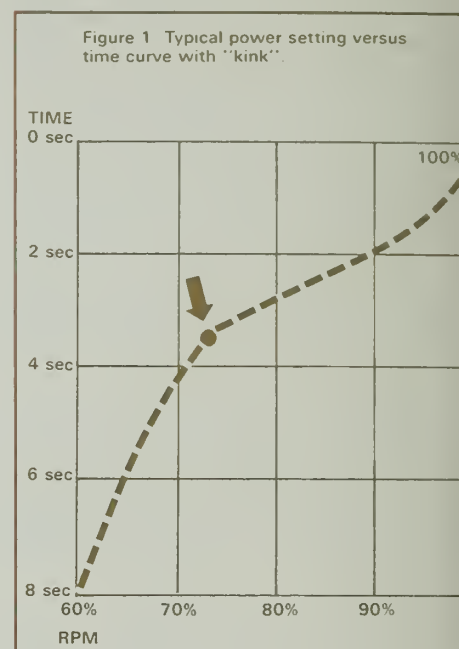
An aeroplane possessing greater momentum will tend to go on diverging longer from its required flight path after a given initial disturbance and will require more time for correction for a given restoring force, or a higher force for the same time for the same correction value.

In other words, precise flying is mandatory and we must make timely, effective corrections to stop any deviations that occur.

In addition to momentum, the spool-up time of KC-135 engines can also affect our corrective actions. This is especially true when the engines are at low power settings. Boeing tells us that from a normal approach setting the engines require approximately three seconds to spool up to full go-around power and about two seconds to get significantly increased thrust. This same push up takes four seconds from 75% RPM and about seven seconds from idle. In the latter case, the engines don't provide significant thrust for five seconds.

Another factor to consider when flying approaches is that when our throttles are back it takes a large lever movement to deliver a significant increase in thrust, while at higher settings a much smaller lever movement is required. This is a characteristic of all jet engines. Throttle movement between 65% and 75% RPM will deliver a 10% increase in thrust, while movement between 85% and 95% RPM will deliver about a 30% increase. Most jet engines have a kink in their thrust curve around 5% RPM below a typical approach setting. Thrust will increase slower below this kink and therefore we should avoid throttle operation very far below this point on an approach when possible. (Fig. 1)

Our naturally high sink rate on an approach should also keep us alert. This sink rate is due to the way our airplane was designed, but basically points us once again to our high



e KC-135

Capt Brian T. Kelly
41 AREFS, Griffiss AFB

speed. Since a three degree glideslope looks the same in any airplane, if we fly it faster, we must do so with more sink rate. This sink rate is no problem to achieve; our swept wing, with its high induced drag, gives it to us automatically. The problem comes in when we want to reduce the sink rate. Now we must fight momentum, long spool-up time, and excess induced drag in getting back to where we want to be.

In making those corrections, we must keep in mind that one of the primary controls for sink rate is power. We often get locked into thinking of power for speed and forget that we can trim our airplane for a certain speed and then fly our glideslope strictly with power. Consequently, if we think of power when correcting our vertical velocity (VVI) and then pitch as necessary to control our speed, our first thought when arresting a sink rate will be to get our power in.

After the final approach, of course, comes the landing phase, which begins as we approach

the runway threshold. Since we are in the "region of reverse command" at this point and flying relatively slowly, our power should be fairly high because of the increase in induced drag. This occurs because we are below the endurance or min power speed, and in this region more power is required to fly slower, given a steady state flight condition. This doesn't mean that we slow down when we add power or speed up when we reduce it. It means that if our airplane slows down for any reason (gusts, making a pitch change, etc.), causing an increase in angle of attack as we try to maintain a steady flight condition, we will need more power to overcome the increased induced drag.

Keeping the above discussion in mind, how can we reach threshold speed as recommended by the flight manual? First we could lose those few knots with a slight power reduction and trim change. A slight round out over the threshold, however, can accomplish the same thing without touching the

power. We can do this by bringing the yoke back gently, increasing the angle of attack. This naturally slows the airplane, and would normally require more power to maintain a constant sink rate. However, as we begin our round out, we also encounter ground effect, which effectively increases lift slightly without an increase in drag. This extra lift tends to reduce our VVI and offsets the need to add power at our now lower speed. We've basically brought our nose up to hit our threshold speed, and used ground effect to reduce our sink rate.

Whatever technique you use, most throttle movements should be reserved for changing your flight conditions and making corrections.

In fact, the **KC-135 Flight Instructor Guide** says, "the key to making

good landings in the KC-135 is proper power control." This power control is used for things like reducing excessive sink rates, combating crosswind effects, and putting our wheels on



Applying Aerodynamics to Landing the KC-135

the ground when we desire. D. P. Davis gives us an excellent example of this type of control:

The solution of a high sink rate very close to the ground is a short application of high thrust. Rely only on the thrust to cut the sink rate and don't rotate the aeroplane nose up, in spite of the temptation: a sharp rotation very close to the ground will only drive the gear on harder. This is because over a very short period of time, sudden up elevator merely lowers the tail, causing the gear to hit the ground before the increased incidence

has had time to produce increased lift.

This brings us to the point of actually landing the aircraft, which we accomplish by flaring to the landing attitude, which is a level flight picture. If we keep this basic attitude constant and reduce power to idle, the tanker will land itself as our airspeed drops off. We maintain a very small sink rate and slightly increase back pressure as our speed decreases to hold the attitude constant. This back pressure fights the pendulum effect of decreasing power, gives us the needed increase in angle of attack due to

decreasing airspeed, and also combats the ground effect encountered by the horizontal stabilizer. This latter factor refers to the fact that the stabilizer actually flies too well in the ground effect, which can cause a pitch down unless we counter it with back pressure.

The principles of momentum, spool-up time, sink rate control, power management and flare effects should help you understand the aerodynamics involved in landing the KC-135. A bit of this, and a lot of practice, can add up to better, safer landings.



Ten Steps to a Perfect Landing

Maj Kirk R. Ransdell
349 AREFS, Beale AFB

Do you want to improve your landings? Does your Nav break down and cry every time it is your turn to land? If so, these simple steps can guarantee your consistently good, safe landings.

1. **First of all, a good landing starts on the ground:** Have a good understanding of the approach and field environment. Look over the glide slope and approach lighting. Mentally fly the approach and landing. Think through all your motions.

2. **Seat position:** This is something that many pilots ignore. It is critical to your landing picture to have the same seat position every time. Try this technique: adjust your seat height so you can just barely see the top of the rain repellant post outside the windscreen. Adjust your seat so you have a comfortable position where you can rest your arms on the arm rests.

3. **Understand the concept of LARM.** "LARM" means land-attitude reference mark. Basically it is a point on your windscreen that will set you up for a perfect three degree glide slope, and a perfect landing attitude picture. Set up your LARM like this:

a. Sitting on the ground in your perfectly adjusted seat, you should be able to look out through the windscreen at the distant horizon and see the horizon line running exactly one-third of the way up your windscreen:

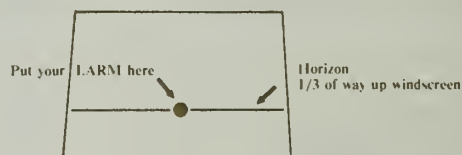


Fig. 1 Horizon picture on the ground if your seat is adjusted correctly

This LARM has two more functions:

- (1) Glide slope control.
- (2) Landing attitude control.

b. **Glide slope control.** When on a perfect three glide slope, your LARM now should be exactly in the middle of your aim point. Your aim point is 1,000' from the threshold, in the middle of the "captain's bars."

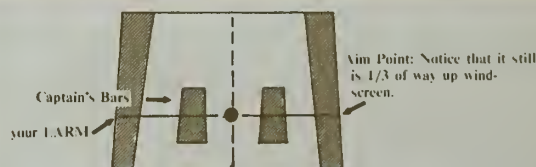
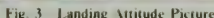


Fig. 2 On Final: What you're aiming for

c. Landing attitude control: The third use of your LARM is in the landing attitude. The perfect landing picture is when your dot intersects the far end of the runway.



4. **Fly a good approach.** What we mean is: on air-speed, on centerline, on glideslope. If you're off any of these, correct back immediately.

b. Power should be around 4000 pounds per engine (medium wt). Trim should be around five units nose up (50 flaps).

5. **Pick an aim point** and stay on glide path to that aim point — don't duck under!

6. **Decide to land:** Use 200' AGL as your decision height. If you're properly set up, and able to land, tell

7. **Check for windshear:** Have your Nav monitor ground speed to check for windshear. Just as you're crossing the threshold, check your airspeed, and VVI, (around 200 fpm), and adjust your power if required. Do this prior to your flare.

9. **Establish the landing attitude:** When? Establish the landing attitude just when your aim point starts to disappear under the nose. This is a very smooth three-second maneuver. Flare at about the same rate that you rotate — about three seconds.

a. Pull your power slightly early when your aircraft is heavy, winds are calm, or when you have less than 50 degrees of flaps.

b. Pull your power as you flare if you are medium weight, winds are normal, or if you have 50 degrees of flaps.

c. Pull your power slightly late if you are light, or if you have a strong headwind.

Next time you mission plan, go over these 10 steps. Prior to descent, go over them again. During final approach, actively apply them. As you smoothly “squeek” it on, congratulate yourself on your newly acquired skill . . . and smile — knowing that your Nav and Boom will never laugh at your landings again!

Happy Landings!

PROJECT WARRIOR

gan, 449th Flying Training Squadron, Mather AFB CA 95655.





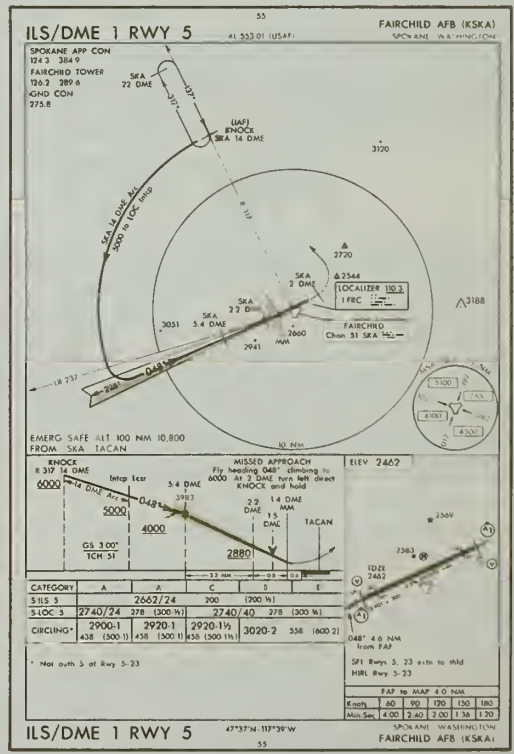
TEN EASY QUESTIONS

The following questions are based on the ILS/DME 2 RWY 5 IAP for Fairchild AFB, Wash.

- When flying the ILS approach, you may depart 4000 ft ____.
A. at 5.4 DME
B. when the glide slope is intercepted.
C. when told to 'begin descent' by the final controller.
D. Both, A and B above
- What is the final approach fix altitude for a localizer only approach?
A. 5000 ft MSL
B. 4000 ft MSL
C. 3983 ft MSL
D. 2880 ft MSL
- You are flying the **ILS approach** and have intercepted the localizer. Approximately 10 miles on final and level at 4000 ft, the DME breaks lock and approach control advises the Fairchild TACAN is out of service. You:
A. must abandon the ILS approach regardless of approach controls ability to identify the FAF because the IAP does not specify "radar/DME" for the FAF.
B. may continue to fly the approach provided approach control identifies 5.4 DME.
C. may continue to fly the approach with no assistance from approach control.
D. must abandon the ILS approach because it is an ILS/DME approach meaning both are required.
- At 25 DME while flying an enroute descent you receive the following clearance, "SIFIC 01, turn left heading 075, maintain 5000 ft until established on the localizer, cleared ILS/DME 1 approach". You:
A. cannot accept this clearance because the localizer is only useable to 18 NM.
B. can accept the clearance only if the localizer has been flight checked to at least 25 NM.
C. would accept this clearance on a normal training mission; however, if stan eval was on board I might have second thoughts.
D. can accept the clearance because you were radar vectored to final.
- When flying the **localizer only** approach, for planning purposes, you may use ____ to determine the missed approach point.
A. timing
B. the middle marker
C. DME
D. All of the above.

- You are flying a localizer only approach when the DME breaks lock at 3 DME. If timing was utilized as a backup, you:
A. must go missed approach.
B. could continue the approach, but the MDA will be 2880 ft MSL.
C. could continue the approach down to published minimums.
- The missed approach point for this ILS approach is identified by:
A. the DH of 2662 ft MSL.
B. the middle marker.
C. Both A and B, above.
D. There is no missed approach point for precision approaches.
- When turning inbound on the localizer from the 14 DME arc you must start the turn when passing the 237 degree radial.
A. TRUE
B. FALSE
- Since the **MSA chart** shows a minimum altitude of 5100 ft in the northwest sector, you must maintain 5100 ft or above until passing the 102 degree course when on the 14 NM arc.
A. TRUE
B. FALSE
- On an ILS approach you may not descend below 2662 ft MSL unless the aircraft is in a position to land and the runway environment is clearly visible.
A. TRUE
B. FALSE

Answers on page 21



GO AROUND!

Those were the words I screamed as I came on the controls and shoved the throttle forward.

Up to this point the mission had been okay, not perfect but okay. We had taken off at night for a B-52 refueling mission but canceled enroute to the track due to thunderstorms. The pilot was scheduled for a pilot proficiency ride so we recovered back to home base. It didn't look as if the weather would be a factor there for awhile.

We completed the pilot's work which included three engine landings and a simulated jammed stabilizer trim approach using speed brakes to trim. Since we had time to fly out, I put the copilot in the left seat for some work.

He was a fairly senior copilot and was doing a super job. After a couple of approaches and touch and go landings, tower informed us that they had a tanker inbound with an engine shut-down and would be switching runways so it could take advantage of a three knot headwind.

I had been an instructor for about a year but had only been at the base for a couple of months. We accepted sequencing to the other runway to be number two behind the IFE. As we were being vectored, the pilot in the jump seat was running the checklist for us. This was the first time I'd flown an approach to this runway but I didn't feel it would be a problem, it would just require a little more attention. I elected to have the copilot fly a simulated jammed stabilizer approach so he could experience trimming with speed brakes.

The weather in the area was deteriorating at this time and I had the navigator check radar, at the same time I asked the pilot to call METRO and get their input on the weather.

At this point things started getting busy. Inputs were coming from all directions. The IFE was on short final and we had also been cleared to land. The copilot was flying a good approach

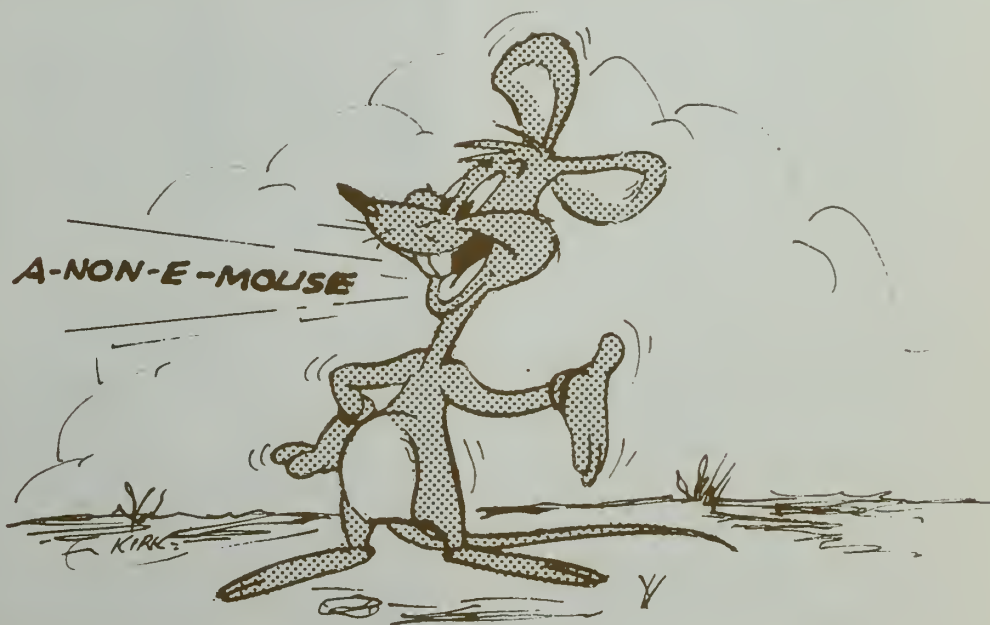
with speed brakes for trim. A thunderstorm was 10 miles from the field and I made a decision to full stop this approach and call it a night. I was VFR and we could see the IFE, still in the process of clearing the runway. Cross checking the approach and airspeed the co was right-on. Finally, the IFE cleared the runway, we continued and went visual to land. The copilot put us in a nice flare and slowly brought the throttles to idle as he had been briefed. That's when it happened. The warning horn went off. My mind started racing. Whether the fact just registered or the light in the handle caught my eye I don't know but I realized the GEAR WASN'T DOWN! That's when I yelled GO AROUND! and came on the controls.

The airplane started to accelerate and I put it in a gentle climb. Once we were climbing away from the runway, I brought the flaps to 30° and requested a closed visual pattern to a full stop. As we rolled out on downwind, I asked the rest of the crew if they understood why we went around. I flew the full stop without any further problems.

How had we gotten so close to landing without the gear? Three pilots, a

navigator and a boom had all missed it. Habit pattern interference was one factor. Weather and the concern about the IFE clearing the runway had broken up my attention, along with monitoring the approach and the copilot. IP task overload is what that boils down to. Cockpit lighting was also a factor, as we had the forward floods on which put everything on the instrument panel in a reddish hue. The jump seat pilot, who had been running the checklist, had been distracted by his call to weather. Discussions with the boom and navigator revealed that they never look up front to verify gear down, though they would hit the ground just as hard as the rest of us. Where were tower and foxtrot? First of all it isn't in any way their fault that we didn't put the gear down but you always hear stories about them sending people around for it. Foxtrot was involved with the IFE recovery and tower couldn't see our gear at night.

Fortunately the lessons learned were cheap. I'd never done that before and doubt that I'll ever have it happen again. I'm writing this so that you might get a cheap lesson on lighting, checklists and crew responsibilities.



1984 SAC Combat Weapons Loading Competition

Capt Sheila Disbrow
HQ SAC/LGWM

"What time is it?"

"Barren-time!" went the cheer from the 1983 SAC Combat Weapons Loading Competition Barrentine Trophy winners from the 416 BMW at Griffiss AFB.

On 5-12 Sept 1984, 17 SAC bomb wings will once again meet at Ellsworth AFB to compete in the 1984 SAC Weapons Loading Competition and determine whether Griffiss will maintain the crown as "best overall" team in SAC.

What is SAC Weapons Loading Competition? More commonly referred to as "Load Comp," this competition pits teams consisting of munitions, security and crew chief personnel against each other in an outstanding demonstration of the technical skills so vital to our strategic deterrent mission. In addition, the competition provides a forum for some of SAC's top performers to exchange ideas and learn by example from their contemporaries. First and foremost, though, the competition is a source of recognition for those personnel who are the backbone of the SAC mission, yet are often taken for granted during day-to-day SAC peacetime operations.

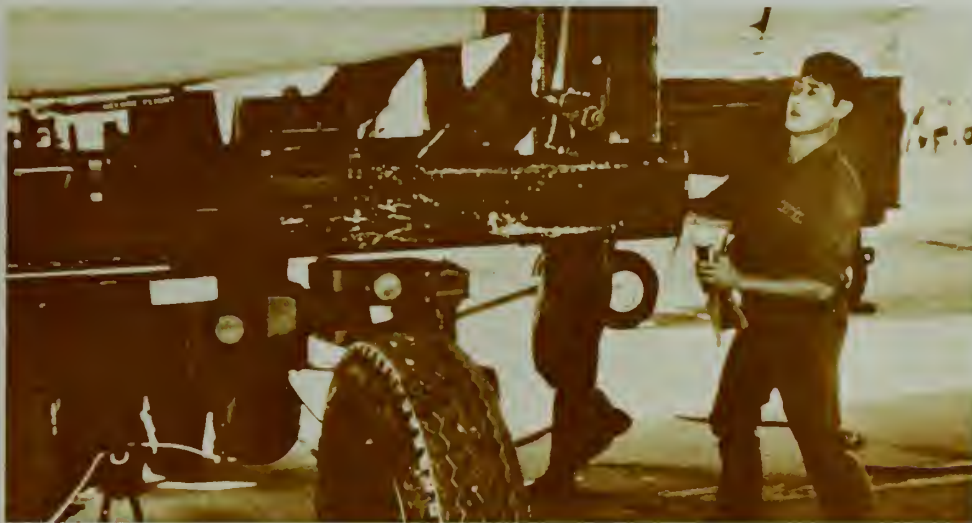
Specifically, each competition team is composed of a five person munitions load crew, an aircraft crew chief, a six person security police element and a team project officer and noncommissioned officer. Munitions loading will be accomplished on ASQ-38 and Offensive Avionics System (OAS) modified B-52G and H aircraft and an FB-111. Each team is evaluated on the condition of its equipment, two munitions loads, and a written test. The maximum possible score for each load team is 1250 points. Security police teams compete in a practical exercise, confidence course,



tactical weapons firing, and a written test. Their maximum score is 500 points. Aircraft crew chiefs perform aircraft preload and postload exercises and also take a written exam for a maximum total of 250 points.

The wing team which scores the closest to 3000 points overall is awarded the coveted Barrentine Memorial Trophy, named for CMSgt Wilbur R. Barrentine, a member of SAC from the mid-fifties until his death in 1970. Other major awards include Best Munitions Load Crew, Best Security Police Unit, Best Bomber Crew Chief, Best Air Launched Cruise Missile (ALCM) Load Crew and Best Combined Load Crew.

This year marks the 15th anniversary of SAC Weapons Loading Competition. There have been numerous changes to competition events over the years as equipment upgrades and new weapons systems have changed and improved the way we do business. This year is no exception. New events for 1984 include ALCM pylon loading and tactical weapons firing. "Loading ALCM will be a real challenge," according to Lt Col Thomas Monheim, SAC project officer for the 1984 competition. "Ellsworth is not an ALCM unit, so we must TDY all ALCM related equipment and support personnel from our five operational ALCM units. This year will be a learning experience, but we still expect to see some outstanding ALCM load times. We have already heard rumors of 40 minute practice load times at some units, which is extremely fast when you consider the size of a loaded ALCM pylon on an MHU-173 lift trailer (approximately the size of an F-15 aircraft) and the complexity of the entire loading



operation." The M-16 Tactical Weapons Firing Course will test the abilities of security team members against snipers and an ambush team armed with Multiple Integrated Laser Engagement System (MILES) equipment. "The switch from the static firing of past competitions to the action of the tactical firing course will lend a lot of excitement to this year's load comp," commented SMSgt Tom Gorman, SAC's SP competition project officer. "The MILES equipment allows for a realistic scenario to test the responses of a security force under fire."

Preparing for Weapons Loading Competition is no easy job. All 17 competition teams have been hard at work this summer, practicing tasks, improving techniques, performing for as many audiences as they can gather and raising funds for the trip to Ellsworth. Motivation and spirit are at fever pitch and will reach their peak come competition time. Everyone wants the Barrentine! *Best of luck to each team as you compete for "best in SAC" honors.*

1983 AWARD WINNERS

Barrentine Trophy - 416 BMW,
Griffiss AFB
Best Munitions Team - 43 MMS,
Andersen AFB
Best Security Team - 320 SPS,
Mather AFB
Best Aircraft Crew Chief -
42 OMS, Loring AFB

SAC Accepts First



Strategic Air Command received its first KC-135R during ceremonies held July 2, 1984 at the Boeing Military Airplane Company in Wichita, Kansas.

Boeing official Lionel Alford presented the aircraft to Lt Gen Thomas H. McMullen, commander of Aeronautical Systems Division, Wright-Patterson AFB.

Gen Bennie L. Davis, commander in chief SAC, then accepted responsibility for the aircraft from General McMullen. The 384th Air Refueling Wing at nearby McConnell AFB received the first re-engined aircraft.

The KC-135 modernization program is one of the largest of its kind ever undertaken by the Air Force. With the fuel-efficient, advanced technology CFM-56 engines and other subsystem improvements, the KC-135R will provide the "old tanker" another 20 years of "new life" with significantly improved overall capability.

General Davis stressed the KC-135R's fuel efficiency in a statement following the ceremony. "It's still the most economical in specific fuel consumption — which

means you get more miles to the gallon per pound of thrust," said the general.

A military version of the popular Boeing 707 transport, the KC-135 operates at near sonic speed and at high altitudes above 40,000 feet. It was first delivered to SAC in 1957.

The KC-135R not only will carry more fuel farther (providing one and a half times the fuel offload capacity of the present KC-135A), but will have reduced maintenance costs, be able to operate from shorter runways and fully meet federal noise and emission standards.

An Air Force Operational Test and Evaluation Center official said the KC-135R operational test and evaluation went very well. According to Capt Carol L. Northrup, director of AFOTEC Public Affairs, the aircraft's performance exceeded AFOTEC expectations.

"By and large the pilots were impressed with the improved handling qualities of the aircraft," Capt Northrup said. "The maintenance personnel were also impressed with the reliability of the new modified sys-

KC-135R



General Bennie L. Davis, commander in chief, SAC, accepts delivery of the first reengined KC-135R from Lt Gen Thomas H. McMullen, commander of Aeronautical Systems Division.

tems. They found it (KC-135R) generally required fewer maintenance hours to keep it flying than the KC-135A and that it was easier to work on and keep ready to fly," the Captain added.

The first aircraft had been put through a demanding, rigorous, developmental and operational test and evaluation schedule that included over 560 flight hours and a two month stay in temperatures down to minus 60 degrees Fahrenheit at the Air Force Climatic Laboratory, Eglin AFB.

So July 2, 1984 indeed marked the beginning of a new era for the KC-135. Aircraft 61-0293 reported for duty at McConnell AFB as 384th AREFW commander Col Richard A. Steeves noted, "We in the 384th AREFW look forward to training the command's tanker force on the KC-135R. We're honored to be the first wing and base to convert to the R model."



General Davis addresses the large crowd gathered for ceremonies held July 2, 1984.





Pressure Pattern by Temperature — Again?

Maj David L. Timmons, CFIC IN

Now that the KC-135Rs are all equipped with the INS/DNS system and the old radio altimeters have been removed, it seems that pressure pattern techniques are a thing of the past. Pressure pattern navigation has even been de-emphasized in SACR 50-4, Vol I, which says: "Pressure pattern and temperature procedures are encouraged when the overwater portion of the mission is above 20 degrees north latitude or below 20 degrees south latitude and more than 50 NM from suitable radar returns." So why worry about pressure pattern anyway?

Well, picture this: you are halfway between Hickam and Guam and have just altered around thunderstorms for the second time, the doppler has been in memory for the last hour and the DNS is unreliable. Your manual DR shows you 6 NM left of course. The INS shows you 25 NM right of course and celestial shots on the sun are giving you speed line LOPs. Wouldn't it be nice to have a course line LOP to assist in evaluating your position? Of course it would. This is where pressure pattern by temperature comes into play. There are several "D" value tables available in different handouts at different bases. The one I personally prefer to use is based on the amount of temperature change between readings instead of the actual temperature readings (Table 1).

It is important to ready the gauge OAT carefully since you enter the "D" value table in increments as small as one quarter of a degree. Failure to ac-

curately read the gauge OAT could result in errors of 6 to 8 NM in the PLOP. It is also important to take the temperature readings at consistent intervals, such as 5 minutes prior to each fix or MPP.

All of this is coming back to you now, I hope, especially if you haven't used pressure pattern by temperature in a while. Well, there is one big problem with all this. Pressure pattern navigation works correctly if the airspeed remains constant. When pressure pattern by temperature became popular a few years ago it was encouraged on overland nav legs. Most of the navs, including myself, lost faith in the accuracy of the temperature method after

we got erratic results and didn't know why. A couple years later I read an article about heat of compression (I don't remember the author) and realized this was the reason we got erratic results — airspeed differences on readings, mostly beyond the nav's control, had caused us to enter the table with the wrong temperatures.

Looking for a way to correct for airspeed variations on temperature readings I looked in AFM 51-40 and found this: "Heating occurs at high speeds from friction and the compression of air on the forward edge of the temperature probe. Thus, the indicated air temperature (IAT) is always corrected by a minus correction factor to pro-

duce true air temperature (TAT). Heat of compression increases with true airspeed. The TAT can be obtained from the aircraft flight manual."

So, I went to the aircraft flight manual to find the TAT. It turned out that the true air temperature is found in a chart in the performance section and is similar to a fuel graph. This is cumbersome to use, so by analyzing the graph, a formula can be derived using a constant. It works like this: On the MB-4 computer set 9500 (the constant) on the outer scale above your true airspeed at the time of the reading (on the inner scale) and read the correction value on the inner scale (at the bottom of the computer) under the true airspeed. That is:

$$\frac{9500}{\text{TAS}} = \frac{\text{TAS}}{\text{CORR}}$$

The correction value is always a negative number and will be between -15 and -24 for the airspeeds we fly. It is added to the gauge OAT and gives TRUE OAT. Example: gauge reading -8 degrees and TAS 430. Correction value is -19.5. When added to the gauge reading you get a TRUE OAT of -27.5.

Now spin -8 degrees and 440 TAS and you get a correction value of -20.5. This is a whole degree difference in temperature caused by heat of compression when the TAS increased 10 knots. This will make your pressure line of position unreliable, unless heat of compression is taken into account.

Well, how do we account for heat of compression so our PLOP is good? One way is to take temperature readings at the same TAS all the time. This is not always possible, especially when

you fly through air masses of different temperatures and the airspeed varies regardless of pilot technique. Another way is to correct all temperature readings to TRUE OAT and use the difference between these temperatures to enter the "D" value table. This way, it does not matter whether you have the same airspeed on all readings, because you are accounting for the heat of compression error.

With a little practice it will become second nature to convert all readings to TRUE OAT and use them to determine the actual temperature change if the TAS varies on subsequent readings.

If you have been at least recording temperature and true airspeed readings on your trip from Hickam to Guam you can now accurately compute PLOPs using the temperature method and have one more means to help you hit that ADIZ on course!

PRESS ALT DEG CHANGE	"D" Difference per OAT change								
	27M	29M	30M	31M	33M	35M	37M	39M	40M
4	461	507	529	553	600	645	691	737	760
3	346	380	397	415	450	484	518	553	570
2	231	253	265	277	300	323	346	369	380
1	115	127	132	138	150	161	173	184	190
1/2	58	63	66	69	75	81	86	92	95
1/4	29	32	33	35	38	40	43	46	48

1. Record temperature at fix positions
2. Compute CHANGE in temperature
3. Enter chart with DEGREES TEMPERATURE CHANGE and PRESSURE ALTITUDE
4. VALUE obtained represents D, D₁
5. Substitute in the following formula.

VALUE ZN

ETAS - K

6. EXAMPLE: ALTITUDE 31,000' TEMP CHANGE = +11
EFFECTIVE TRUE AIRSPEED = 450 KTS
K FACTOR (LAT) = 33
VALUE FROM TABLE 138
 $\frac{138}{450} = \frac{ZN}{33}$ ZN = +10.1NM

7. If temperature DECREASED, the SIGN is MINUS (-), therefore plot to the RIGHT

If temperature INCREASED, the SIGN is PLUS (+), therefore plot to the LEFT

NOTE: A temperature change from minus (-) 40° to minus (-) 39° is a temperature INCREASE so the PLOP plots to the LEFT

TABLE 1

DO YOU HAVE WHAT IT TAKES?

“**H**ow in the world do you get to be a missile operations evaluator? What a deal — those guys have it made!” As a crewmember, I too asked that same question and on more than one occasion made similar comments. What does it take? Well, for sure it’s not the easiest road to journey, and I don’t profess that what follows is the only way, but for what it’s worth here are some of the lessons I learned along the trail.

Many crewmembers believe that an evaluator need only be knowledgeable and proficient in his or her primary duty. Job knowledge is most certainly the basic and a mandatory requirement, but in and of itself it’s not everything. There is more — much more. Evaluators are primary players in designing, improving and administering the quality control programs that ensure attainment of mission goals. They are the eyes and the ears of the organizations they represent. Job knowledge? Sure you’ve got to have it. A position of responsibility? You bet. What does it take to earn that position of responsibility? Expertise, integrity, judgment, professionalism — ah yes, the trail is getting tougher to travel. And we’re not there yet.

Evaluators also play a significant leadership role in weapon system technical order development and improvement. What does that take? Job knowledge — yes again, but maybe at a little different level than you might think. Certainly one must know how to apply and process weapon system technical order checklist steps in order to operate the weapon system, but what becomes equally important — maybe even more important — is learning exactly how and why the weapon system works the way it does. In-depth system knowledge is essential.

By the way, do you know who the folks are that are working on Peace-keeper technical data right now? The

names aren’t important, what is important is that they are evaluators who probably not more than a year or so ago were pulling alerts in the same launch control centers that you are right now. Can you do it? Sure you can. Read on.

All right, let’s get down to brass tacks. You achieve and maintain the highest level of proficiency in the weapon system that you possibly can. Then you make yourself an expert in every aspect of the mission, everything from system operation to emergency war order application and you must know the rules of evaluation. You will need strong personal desire, initiative and self-discipline to achieve the high standards that are needed. Once you’ve started, you cannot become complacent and you certainly can’t rest on past laurels. A fresh and abiding commitment to improving quality of performance is necessary. Quality must become an attitude. Never accept anything less than your best. If you do, I’ll guarantee that there will always be someone who is better.

Your word must be unquestionable and your integrity indisputable. There can be no doubt about your motive or purpose. Honesty, fairness and impartiality are cornerstones for success as an evaluator. Anything less is not acceptable. Personal feelings and preconceptions must not influence judgment; objectivity is a critical factor, and subjectivity must be limited to a minimum since it is so easily influenced by individual opinion.

On your way to becoming an evaluator, you must also learn to be a fact finder because decisions must be based upon fact. A good evaluator tries to obtain all the facts and never renders a decision based upon incomplete information.

Errors are not awarded based on unsubstantiated opinion. They are

awarded based upon observable, verifiable circumstances. Information which is incomplete inaccurate or tainted with bias is useless because it has no basis in fact. This does not mean an evaluator should not use judgment or express opinion; however, judgment and opinion should always be recognized and applied in a manner that does not distort the facts. Finally, evaluators must be skilled observers. They must be able to discriminate between what they see and what they think they see, and six hours later they must know what they saw.

Being a competent evaluator requires many distinct qualities and characteristics. It is necessary to maintain the highest degree of job knowledge and impart in others a “special trust and confidence” in your abilities. While you must be loyal to your commander and diligent in protecting and furthering the mission, you have a responsibility to those being evaluated. There is no substitute for integrity and impartiality. Remember, the concern of an evaluator is not to “assess errors,” but to ensure that the men and women who operate our ICBM weapon systems have the best possible directives and procedures and to use them consistently and correctly. This concern is essential to the effectiveness of our missile force. Do your job the best way you know how. Take pride in being good at what you do and set the example. How well you fulfill your responsibilities is the most direct measure of your professional competence and integrity — the basic criteria for becoming a command evaluator.

Well, as I said before, these are some of the things I learned on my way to becoming an evaluator. Again, my way is not necessarily the only way — I can only say it worked for me. How about you, can you do it? If your answer is yes, I know just the place for you — see you soon.



The Real Pilot

*A bit of humor published by our friends to the north in **Flight Comment Magazine**. Captain Steve Gallimore, CAF, is the author.*

The Real Pilot knows the show starts as you approach your aircraft to run through a routine external. Remember you want to impress upon everyone that you are a cool, “red hot” pilot — be nonchalant, do what the layman expects; kick the tires, hit the wing with your first, lovingly run your gloved hand over the nose and look under the aircraft with a knowing nod. Make a production of strapping into the aircraft, remembering to give a wave prior to closing the canopy or window, even if there seems to be nobody watching. Your take-off should be maximum performance. Don’t read back any departure instructions since they tend to inhibit your performance — readbacks are useless exercises introduced by an ATC-led group of conspirators to make you look like an idiot — a simple “Rog” will impress upon others that you are above that childishness.

Hey, let’s be serious. If someone lives close to an airport they must like seeing aircraft, right? So let them know you appreciate their support of aviation — amuse the simpletons by ensuring a shock wave is present during the first pass. Remember, at some larger airports there is noise monitoring equipment; normally, rapid throttle movement from idle to full military power while passing over the receiver will cause the monitor to believe the equipment is unserviceable (note: if information make throttle movement less rapid).

OK, why do people go to airshows? For excitement and to get their adrenalin flowing, right? So give it to ’em. If you can get the crowd to part ahead of you like the Red Sea (Biblical analogy) on a “low high-speed pass” those folks will use up all their adrenalin for the next three months and they will respect you for it. The Real Pilot is always aware of his aircraft’s limitations (the general rule of thumb is 100% over the book figures) and this knowledge gives the Real Pilot a tremendous advantage over those not so intelligent; those who follow book figures only because they are prone to developing skid-marks in their shorts while attempting to do feats of derring-do. (Note: the 100% is a ball park figure for ease of calculation under high stress situations.)

The key to an impressive airshow is just to do your own thing — it’s your space, so use it. Every Real Pilot finishes a show soaked in perspiration, indicating he

has flown his aircraft to the limit; if you should notice at the end of the show you are soaked in something else you probably exceeded the limit — don’t worry, it takes time to find that fine line between these bodily functions.

A “beat up” of the landing airport following your aerial bravura is up to you depending upon how you feel and how much fumes remain the tank. Remember this playing around cuts into bar time.



Because You Fly!

Editor's Note: Before making any significant changes to your diet or exercise routine, consult your flight surgeon. Recommended reading: AF Pamphlet 166-16, Aircrew Nutrition.

Capt Wayne G. Terry
Capt Debra L. Terry
11 AREFS, Altus AFB

So, you've made it! And you should be proud of yourself! A year's worth of hard work and effort, determination and sacrifice, long days and sometimes longer nights, ending climatically in the pinning on of Wings. Whether pilot, navigator, boom operator or other crewmember, you made the grade and have joined the ranks of a very elite group. It's been an uphill struggle so far, but the exhilaration of flight makes it all worthwhile. Congratulations! You've made it.

Ah yes — but the beat goes on. And just when you thought you could sit back and relax, you're finding that everyday stresses have a way of crowding in on the enjoyment of flight. Or maybe, as you're reading this, you're beginning to realize just how true this is. It's a demanding lifestyle we've earned, and one we must continue to learn to live with. In the next few pages, we'd like to talk about these stresses — because recognition is half the battle. Then we'll offer some hints on how to reduce stress and continue to experience that exhilaration we've worked so hard for.

Stress is defined as any stimulus that disturbs or interferes with the normal physiological equilibrium of an organism. But what it all boils down to is human factors: elements of human behavior and how they vary in different situations. These have a great deal of impact on mishap causation. So, ask a human engineer what human factors are in the sense of mishap causation and he'll say "It's crew station design and anthropometrics." A physiologist? "It's hypoxia, hyperventilation and trapped and evolved gas effects." If you ask a psychologist, he'll tell you that it has to do with learning, information processing and cognition. (What?!) A pa-

thologist emphasizes the effects of disease and drugs, a sociologist the personality, life event stresses and social relationships. All are correct, but human factors include all of those mentioned above and more, because it deals with everything that effects human behavior.

Now, you're saying "I can't possibly control all that!" Actually, it's much easier than that. So let's put it all under the heading of **STRESS** and define stress as a general term that includes anything that reduces our ability as a flyer to perform at our best. Since you might be exposed to several stresses at the same time, you must be in good health — mentally, emotionally and physically. When you're not in the best of health, you are often unable to adjust to the demands of flying, thereby increasing the possibility of having an aircraft mishap. There are certain stresses we have no control over, such as last minute schedule changes with evaluators on board. We are expected to take them all in stride. Since there's only so much we can handle, the stresses we bring on ourselves by our own actions must be limited. These are called **Self-Imposed Stresses**. Many aircraft accidents have been linked with these self-imposed stresses. For discussion we've broken them down into five categories: psychological, physiological, fatigue, thermal, and cold stress.

PSYCHOLOGICAL: The flying realm demands total mental and physical commitment. Distractions such as family concerns, financial worries or work related problems can occupy your mind to the extent that you may not be able to handle aircraft malfunctions and even routine flight can be disrupted. You must recognize that the demands of flying may not be met when



emotional stresses are present. Any factor that distracts your mind is important and must be given adequate attention. We all realize that military life demands much of every family member — coping with odd schedules, TDY's, missed special occasions, etc. and, when added to the everyday problems of finances, family relationships and other personal problems, these stresses have a tendency to build up inside. This stress will continue to accumulate until properly dealt with. So, you say "What can I do to control them?". Recognition, again, is the first essential step. Observe your crew duty and crew rest time which will greatly enhance your ability to cope. Rest is essential, worrying will only wear you down. Resolve the problems before you fly — it's the only way to prevent them from adversely affecting you, your abilities and the mission. Easy, right? Yea, easier said than done! The problem may be solved in several ways — talking it

out with the person or people involved rather than avoiding the issues at hand, setting an appointment for professional guidance such as a talk with your chaplain or speaking with your commander can help you regain control and keep the situation from reoccurring. They realize it's a unique environment you're in and chances are they've been there themselves. Then, take a look at your lifestyle. Do you give yourself time for you? Do you get adequate recreation? Exercise is essential to both the body and the soul. Also, could you eliminate some of that worry by facing the problems and making those decisions you've been putting off? Take control of what you can control and leave the rest to those in the higher pay grades!

PHYSIOLOGICAL: We are all aware of the requirement of "twelve hours from bottle to throttle" and "no smoking within fifty feet of an aircraft" (or vice versa, as we jokingly state). These two subjects have been getting nationwide attention, with stronger warnings on cigarette packages and the concern over drunk drivers. Some other physiological stresses include drugs/medications and, diet and dehydration. Just how do these effect us as crewmembers?

Alcohol: It is the active ingredient in beverages such as beer, wine, and whiskey. It acts as an anesthetic drug which depresses brain functions. This can cause changes in the person's mood and alertness. An individual will lose normal caution and become reckless, and this can occur before they notice a change in skill or performance. Altitude increases the effects of alcohol — an altitude of 10,000 ft doubles the effect of alcohol on the body. Now, we believe most of us observe the "twelve hours from bottle to throttle", but what might be more important to us are the effects of a hangover. It's a greater safety hazard than mild intoxication and it can sometimes last a long period of time, resulting in re-

duced physical abilities, slowed mental processes and reflexes, poor judgment and a reduced hypoxia tolerance. The only treatment for a hangover is time, so plan ahead.

Smoking: With the Surgeon General's latest report increasing awareness of smoking and its effects, the impact on us, as crewmembers, may be overshadowed. We know of its long term effects of cancer, heart disease and emphysema. But how does it affect us as crewmembers in the flying field? Did you know its short term effects are decreased endurance, reduced night vision and altitude tolerance? We all know that not every

mission taxes our every muscle and thought, but there's always that one flight and when it rains it usually pours!

Drugs/Medication: We all remember our early Flight Surgeon's briefings on self-medication and the importance of seeing him/her when you need medi-

cation for illness. But we also know the pressure exerted (whether intended or not) on aircrews to get the job done. Many aircrew members avoid the flight surgeon, preferring to treat their "minor" illnesses with various "over-the-counter" drugs. We only mean to stay off the dreaded "DNIF" list and usually only intend to self-medicate over the weekend or when we're not due to fly. But such medication may alter or stop many of the normal body functions. Combine these undesired reactions, with different side effects for different people, along with the task of flying a multi-million dollar aircraft and you may create a potential disaster. Take, for example, common cold tablets. They may effectively dry up a runny nose and sinus but side effects of drowsiness and blurred vision are also observed. It's hard enough to stay awake after reporting at O'dark thirty for what seems like hours and hours of droning without the insidious effects of medication. Then there are the unusual and unexpected reactions to certain drugs — allergic reactions. These allergic reactions cannot be accurately predicted so the flight surgeon will ground or caution the aircrew member after prescribing those drugs most likely to cause a reaction. The bottom line is: consult with your flight surgeon if illness strikes. You may spend a few days DNIF but you'll be better off in the long run. And who knows? You may get well quicker and stay well longer rather than live with that nagging cold all winter because you were "on again — off again" medication at home.

Diet and Dehydration: In recent years, the Air Force, along with the rest of the U.S., has gotten very "weight conscious". Flyers who have an improper diet and/or poor eating habits can set themselves up for short term or long term health problems. The information we present is intended to increase your knowledge and assist you in the care of your health through your diet. Again,

"The flying realm demands total mental and physical commitment. Distractions can occupy your mind . . . you might not be able to handle aircraft malfunctions . . . even routine flight can be disrupted."

you should always consult a flight surgeon when considering any significant weight reduction program. Now we come to the hottest item on the agenda. So much documentation exists in this particular area that we have cut and spliced several articles to give you the "meat" of the information (sorry about that!).

First, let's talk about the problems encountered when reducing weight. Essentially all diets work by reducing caloric intake either directly by low calorie, high fiber diets or fasting, or indirectly by suppressing the appetite with high protein or low carbohydrate diets. One result of all the above methods is a reduction in the body's store of glycogen — its source of energy. The immediate reaction to this reduction is a decrease in stamina which ultimately results in an earlier onset of fatigue. Fatigue can make the difference when a critical decision needs to be made. With a growing number of researchers studying how the brain responds to nutrients — here's some food for thought. These researchers have discovered that our moods, our alertness, our ability to remember, even our perceptions of pain can be affected by what we eat. Once food is broken down into individual nutrients in the digestive tract, these nutrients enter the bloodstream and circulate through the brain, where a few of them penetrate the brain's neurons or nerve cells, affecting the production of neurotransmitters — chemicals through which the neurons communicate. This lead them to an increased interest in "sleep-causing" foods. We all remember the old belief that warm milk will put you to sleep. Actually, it's a neurotransmitter called serotonin that makes you sleepy but to produce serotonin the neurons in your brain need tryptophan, a amino acid found in meats and milk. Tryptophan is the scarcest amino acid in most protein and, therefore, in a poor competitive position to cross the blood-brain carrier. Carbohydrates turn out to be the key. They increase the body's secretion of insulin, which clears the blood of amino acids. While the amino acids crowd into the muscle cells, more tryptophan enters the brain and VOILA! When the carbohydrates flood the cells, you experience energy anew, all shortlived as the tryptophan lulls the brain to sleep. This information may help us when we're fighting to stay awake during those long over-water deployers. Recommendation: avoid high-carbohydrate (junk food) meals before flight. If you're interested in weight reduction and control, discuss your diet with the flight surgeon. His expertise in the flying field can help point out important factors you need to consider as a flyer. Plan a moderate diet as crash diets rarely produce long-term benefits and are much more likely to cause hypoglycemia (an abnormally low level of glucose in the blood which decreases body efficiency). Always eat prior to flight and attempt to limit your intake of foods and beverages containing large amounts of refined sugar — when eaten with limited protein, they may cause a delayed hypoglycemia one to three hours later.

Water. It's the world's most healthful and inexpensive beverage. It can increase energy and endurance, aid digestion and elimination, regulate the body's temper-

ature, and bring about a feeling of well-being. Yet, very few of us consume as much water as we should. Several conclusions have been drawn from recent studies — first, thirst isn't a good indicator of the body's need for water. You must, in general, drink more liquid than your thirst seems to call for. Second, there's a close relationship between water consumption and fatigue. Third, water appears to have a significant effect upon the regulation of body temperature. And fourth, a more active person is in greater need of water because of the dehydrating effects of perspiration and rapid breathing. Exactly how much water should you drink? Generally speaking, the average person loses at least two cups of water daily through the respiratory process. Another two cups are lost through perspiration, even when no significant amount of physical work is carried on, and the intestines and kidneys together lose a total of about six cups during the day. Adding up your losses you come up with a total loss of ten cups, not counting loss through perspiration during extreme physical exertion. Now, consider where the body gets (or should get) its fluids. Most food contains a large amount of water — 3½ cups from what is eaten over the course of a day. The body's metabolism itself is another source of ½ cup making four cups. Therefore, the average person needs to drink six to eight cups of water daily just to keep functioning well. This changes with the amount of exercise you get, food you eat and climate you live in, however, these factors increase your fluid intake, not decrease it. We've discussed how much and where you should get your fluids, so the next question is when. It's usually best to replace liquid as your body eliminates it: there's no point in getting up and downing eight cups all at once. A healthy habit to get into is to take a drink at every fountain you pass. Let's look at some of our popular beverages. Coffee — whether caffeinated or decaffeinated it still can't replace the water you need. Coffee actually causes the body to lose more water than it gains. Carbonated drinks — composed of water, sugar, and artificial colorings and flavors, they possess very little nutritional or liquid value. Sugar can complicate the absorption of water into the body. Alcohol — as discussed earlier, it acts to eliminate water rather than absorb it. One should be aware that thirst is not a good indicator of the body's requirement for water — if you are thirsty you are already a "quart low" and dehydration becomes a potential problem. Even the early stages of dehydration can lead to emotional alterations and impaired judgment. Fatigue through dehydration must be realized and treated. Drink more water and quench that fatigue!

FATIGUE: Exhaustion and fatigue are two of the most serious problems we crewmembers face. They are the most dangerous hazards to safety because you may not be aware of them until serious errors have already been made. Each month, the Safety office sees several messages cross the desk concerning the role played by fatigue and exhaustion. The fatigue we are most used to is that due to heavy use of one set of muscles, such as with exercise. But in the cockpit, psychological, men-

continued on page 24

TEN EASY QUESTIONS

ANSWERS

Cont'd from page 8

1. **(B)** 4000 ft is the minimum published glide slope intercept altitude; therefore where the glide slope is intercepted, begin descent. At 5.4 DME you will be at 3983 ft MSL if on glide slope, and you can cross-check your altimeters' accuracy.
2. **(B)** The non-precision FAF altitude is the same as the glide slope intercept altitude unless otherwise noted. This comes right out of the "altitudes" legend in any IAP booklet.
3. **(C)** Studying the final approach portion of the IAP, you should note that DME would **not** be required to fly the ILS final approach segment. Although DME is not needed for the ILS, the reason this approach is named "ILS/DME" is because AFM 55-9 (TERPS) requires the "/DME" whenever DME is the only published means to identify the FAF. If "radar/5.4 DME" was depicted as the FAF, the approach would have been named ILS 1 RWY 5. But realize, this would not have any effect on the ILS portion of the approach. Radar/DME would only be needed to identify the FAF for a localizer approach.
4. **(D)** AFM 51-37, para 6-16a(1)(c), states, "the localizer is useable to at least 18 NM unless the IAP depicts a greater distance or radar service is being provided. The nebulous term "radar service" really means radar vectoring, radar monitoring, or radar separation. Therefore interception of the localizer course beyond 18 NM would be authorized.
5. **(A) or (C)** This is kind of a "trick question", like you might find on a squadron CEVG prep test. The key to the answer lies in "for planning purposes". AFM 51-37, para 6-16a(2)(b) NOTE, tells us that timing or DME must be used for planning purposes. The middle marker (MM) can be used during the approach, but **only** if other indications are about right. The MM cannot be used as a primary means to identify the MAP because there is no way to ensure proper operation of the system until flying over the marker.
However, use caution when applying this option. By definition, the MM defines a point along the glide slope of an ILS normally located at or near the point of DH. The MM was not designed to identify the MAP for a localizer approach. Depending on the approach, the MM may not coincide with the localizer MAP.
6. **(B)** The real question is, how do you handle a step down fix that cannot be identified? AFM 51-37, para 6-16a(2)(h), provides us with the guidance. In a nut-

shell, it tells us that a descent below a stepdown fix is not authorized unless the fix can be properly identified. In this case we could go missed approach, but this is not necessary. Since timing was used as a backup, the better option is to continue to the MAP using 2880 ft as the MDA.

7. **(A)** The missed approach point for an ILS approach is the published decision height. If you picked answer 'C', it is incorrect. The MM is located at or near DH and was installed to alert the pilot that he is at or approaching the published DH. It was not intended to be used as the ILS MAP.
8. **(B)** No, you don't have to start the turn at the published lead radial. The lead radial is for informational purposes only. TERPS requires lead radials to provide 2 NM of lead. Unless your TAS is 240 knots or greater, a turn initiated at the published lead radial will result in an undershoot.
Whenever an arc to radial intercept is required, it is a good technique to compute a lead radial based on the turning performance of your aircraft. On this approach, if our TAS is 180 knots (.3 mach), then the turn radius (TR) would be 1 NM (TR = mach - 2). Using a little 60 to 1, for the 14 DME arc, 1 mile is about 4 degrees. Therefore, a lead radial of 232 degrees should be sufficient.
9. **(B)** When flying a published route (IAP, etc.) comply with the published altitudes. The MSA chart is based on the highest obstacle within the sector. The approach obstacle clearance area obviously would not use all the airspace in the northwest sector. The controlling obstacle for the 5100 ft sector is outside the approach obstacle clearance area.
10. **(B)** Alas, another "trick question". 2662 ft MSL is the published DH for the ILS approach. Upon reaching that altitude, you would make a decision on whether to go missed approach or continue. If the decision is to go missed approach the aircraft will continue to descend below DH until a climb is established. How much below DH you actually descend depends on factors such as pilot reaction time, descent rate, aircraft weight, and wind to name a few.

We trust everybody got 100% on the quiz. After all, we fly ILS approaches on almost every mission and have all the procedures and acceptable techniques down pat. If you have any questions on our answers, don't hesitate to give us a call at Autovon 347-4571.



PROFESSIONAL PERFORMERS

Aircraft Maintenance



Sgt Francis W. Perkins, 28 BMW, Ellsworth AFB, is SSAC's Maintenance Airman of the Month. Sgt Perkins has identified himself as a productive, mission oriented metals processing working leader who possesses superior technical ability, sound judgment, outstanding job knowledge and exceptional devotion to duty. For example, Sgt Perkins took charge of all shop heat-treating work and established a program for training shop personnel on proper heat-treat techniques. He trained personnel to a high degree of competency and the result is error-free work being produced by everyone he trained. He also repaired cracks on B-52 tow bars which could have caused failure during B-52 alert aircraft towing operations. On several occasions, these bomber tow bars were brought to the 28th FMS Welding Shop for major repairs. Sgt Perkins personally took responsibility for the needed repairs and accomplished them with minimum downtime and many hours of overtime. The repairs he accomplished were depot repairs; he coordinated with depot and received permission to accomplish the repairs on station. By doing so, he saved the Air Force approximately \$80,000 and 160 man-hours in one year. The repair he devised is twice as strong as the original item from the manufacturer. He also drew up blueprints to have a water line run from the tool room to a miller arc welder. This welder now has the tungsten arc shield gas (TIG) capabilities and is used to repair aircraft parts. This self-help repair saved approximately \$1,500 by not using civilian contract sources.

Missile Crew

The 351 SMW's Crew E-024, MCCC 1Lt Timothy J. Tibai and DMCCC 2Lt Albert F. Libbrecht, is SAC's Missile Crew of the Month.

During the recent Global Shield exercise, Crew E-024 assumed alert responsibilities at Bravo One LCC. During the commander's LCC inspection of the radio set group, smoke started to billow out of the lower unit of the rack when the highest UHF frequency was selected and the radio keyed. Quickly determining that crew safety was not yet in danger, the crew immediately processed the LCC fire and overheat checklist, taking their initial actions to electrically isolate the radio set group and monitor for additional fire indication. Smoke continued to fill the capsule, indicating that a fire and extensive damage to radio set group was imminent. The crew diligently proceeded with their checklist actions — electrically isolating the unit and monitored for additional indications. The smoke began to dissipate indicating the overheat condition was under control. The crew made their required reports to the appropriate base agencies and notified the squadron command post in order to update the wing communication status. Radio maintenance instructed the crew to resume HF operations since the crew had isolated the unit before extensive damage affected the HF system. Through the



prompt and thorough efforts of the crew, damage to the radio set group was kept to a minimum. The effectiveness of the crew and importance they placed on the situation led to an early dispatch of a radio maintenance team and the crew had full operational communication capability within four hours. In addition to their emergency situation, the crew was occupied with several SAC and flight exercises, teams in the LCC and LCEB performing a dash six inspection and severe weather in the flight areas resulting in numerous power failures at Bravo LCF.

Missile Maintenance

Sgt Steven M. King, 381 SMW, McConnell AFB, is SSAC ICBM Maintenance Airman of the Month. Sgt King certified as a team chief, a position normally requiring three years experience, after just one and a half years. As a team chief, he has expertly supervised 10 rocket engine inspections, 15 missile inspections and five hazardous ordnance operations. During these tasks, he discovered, documented or corrected critical discrepancies, saving over 40 off-alert hours.

Sgt King's exceptional judgment is clearly evident and has led to his qualification on many critical tasks. As a category I, rocket fuel handler's clothing outfit specialist, he significantly contributed to the successful completion of three hazardous seal changes involving loaded propellant tanks. As a special purpose vehicle operator, Sgt King transports stage I and II airframes and reentry vehicles. He also operates the Pettibone crane used in mating/demating warheads and other major maintenance. Sgt King maintains an excellent personal and team evaluation record. He has earned the prestigious Master Technician Badge, which recognizes his sustained outstanding performance.



continued from page 20

tal and skill fatigue are often the most serious types of fatigue. Skill fatigue can be divided into two categories: acute and chronic. Acute skill fatigue is that which occurs after doing the same thing over and over again causing a loss of strength coordination or attention that occurs during a long mission. Short rest periods or changes in routine will reduce its effects. Chronic skill fatigue occurs when you don't allow enough time to recover from acute skill fatigue. Decreased attention to detail, lack of interest, performance below standard and low morale may be telling you to take some time out and revise your crew rest schedule. Air Force regulations describe the length of the crew duty day and required crew rest before duty. The fact that the average individual will spend one-third of his/her life sleeping tells us that there is a basic physiological and biological need to sleep, that being to recuperate the body from the day's fatigue (there's that word again!). Should you fail to accrue the necessary sleep during crewrest, this added

to the list of fatigue stressors could lead to an incident, an accident, or even a fatality. Improve your quality of sleep and improve your performance in the aircraft. That would seem simple enough. Unfortunately, there are also many factors which affect our daily lives as crewmembers that make the quality of sleep somewhat less than optimal. One such instance is our requirement to deal with the crossing of time zones, disturbing our circadian rhythm or biological clock. In order to "get the job done", positive effort must be exerted to resynchronize our bodies in minimum time. Adjustment occurs rapidly if you obtain proper crew rest and nutrition. By slowly changing the time you eat, play, or sleep as much as a week in advance, you will greatly reduce the effect. If you're staying in the new time zone, adjust as quickly as possible to your new schedule. Finally, adjustment may be prolonged by poor crew rest, missed meals and excesses of nicotine (smoking), caffeine (coffee), or alcohol residual.

SAC'S FLYING SAFETY RECORD

CLASS A FLIGHT MISHAPS

YEAR	74	75	76	77	78	79	80	81	82	83	84
TOTAL MISHAPS	8	4	4	4	1	5	4	4	2	2	0
FLYING HOURS 100,000	5.1	4.2	3.9	3.7	3.6	3.6	3.4	3.5	3.5	3.0	1.7
FATALITIES	14	7	22	10	5	7	2	14	9	7	0
RATE	1.6	1.0	1.0	1.1	.28	1.4	1.2	1.2	.58	.65	0.0

* ESTIMATED RATE BASED ON 310,000 FLYING HOURS

8AF	15AF
4	
2	
0	

1984 CLASS A MISHAPS	

CLASS B	
JUNE	0
1984	1

CLASS C	
JUNE	14
1984	134

FLYING HOURS	
JUNE	27,389
1984	170,200

THERMAL STRESS: A great many Air Force bases worldwide are faced with flying in very high outside air temperatures, with possible heat stress as the end result. Flyers can recognize the effects of heat stress by noting impaired mental function, increase in or complete absence of sweating, increase in body temperature and/or increase in pulse rate. Any of these symptoms are reasons to consult your flight surgeon. Drinking water is the best method for prevention of heat stress and dehydration. As mentioned before you must drink more water than your thirst suggests. Recommendations are to 1) avoid unnecessary exposure before flights, 2) avoid strenuous exercise until after flying, 3) maintain ventilation in the cockpit, especially during ground operations and 4) see your flight surgeon about whether or not salt supplements are required. **DON'T** take salt tablets before flying. Allow yourself 7-14 days to acclimatize to a high temperature environment, maintain good physical condition and drink, drink, drink that water!

COLD STRESS: During cold weather, several human factors are applicable, such as wind chill, hypothermia and frostbite. Whether or not you live in the cold, northern tier, you may experience a wide variety of types and degrees of cold, some more deadly than others. Many of us are not used to nor prepared for cold temperatures. Preparation is the key — so here's a few items you might want to give some thought to:

Wind Chill: Low temperatures and wind team up to destroy tissue. The wind velocity is important because your body loses heat faster when the wind sweeps away the thin layer of warm air next to your skin. (Low humidity or precipitation also increase body heat loss.) Even though the temperatures may be above freezing, wind chill factors can effectively decrease temperatures to subzero levels. Staying dry and preventing exposure of skin to the wind will help prevent what can follow — frostbite.

Frostbite: Frostbite can sneak up on you because there isn't much pain associated with the freezing process — some tingling, stinging or dull ache, but that's soon followed by numbness. Every part of the body is susceptible to frostbite, but ears, nose, hands and feet are most commonly affected. To prevent injury, keep C-O-L-D: Clean clothes insulate better, Overheating will rob heat through sweat so remove a layer of clothes before sweating gets profuse, Loose layers of clothing trap the warm air and insulates as well, while preventing clothing restriction, and Dry clothes are essential to heat retention. If you suspect frostbite, seek professional care immediately. Remember that **PREVENTION** is the best cure.

Hypothermia: Even if the temperature is well above freezing, you can die in less than two hours from exposure. Here's what can happen: when the body temperature drops below the normal 98.6 degrees and dips to 95 degrees, the person may be unable to speak or walk. Usually, he becomes so mentally disoriented he is not even aware of what's happening to him. Below 90 degrees, shivering increases and muscles become

Continued on next page



1984

MISSILE MISHAPS

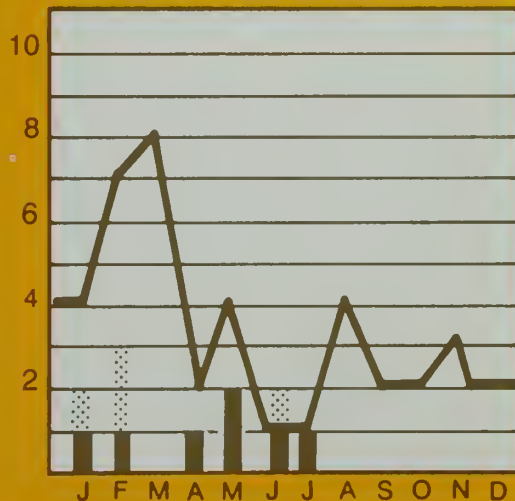
TITAN



AIR LAUNCH MISSILE



MINUTEMAN



PERSONNEL
ERROR

NON PERSONNEL
ERROR

TOTAL MISHAPS
1983

Well Done

Major Thomas J. Goetz, a B-52 IP from the 69 BMS, 42 BMW, Loring AFB, has earned the Well Done Award. Following a no-chute full stop taxi-back landing by the IP upgrade in the right seat, the SOF accomplished a "last chance" inspection and the aircraft was cleared for takeoff. Unknown to anyone, the number one wheel remained locked through the takeoff roll. After a 16 minute pattern with the gear down, the IP upgrade was cleared for a touch and go.

The aircraft touched down on speed with 8200 feet remaining. The number one wheel was still locked and left a solid skid mark to the 7200 feet remaining point where the tire blew violently. At that time the aircraft was 13 feet left of centerline.

The IP initiated abort procedures. Upon application of brakes, the number two tire began a severe shimmy. The forward left truck began to cock right. The aircraft crossed centerline left to right with 5900 feet remaining and was uncontrollable with steering

and/or flight controls. Maj Goetz used asymmetric thrust (engines 7 and 8) for steering. The aircraft stabilized 32 feet right of centerline until the 4100 feet remaining point.

At this time, the IP, concerned with landing roll distance, idled the asymmetric engines. The aircraft began a rapid departure from runway heading. Maj Goetz again applied asymmetric thrust with engines 7 and 8. This stopped the departure from runway heading but not until 3200 feet remaining point, where the aircraft was 120 feet right of centerline. The right

wingtip was 213 feet right of runway centerline, or 63 feet right of the runway edge. The 3000 feet remaining marker went midway between the tip tank and number 7 and 8 engine pod. The airplane corrected slightly left, toward centerline and came to rest 96 feet right of centerline with 2275 feet of runway remaining. The left front truck was cocked 70 degrees right and the number one tire was disintegrated.

A truly "heads up" reaction and skillful flying saved an invaluable strategic aircraft and crew from destruction.



tense and rigid. Below 81 degrees, unconsciousness. 71 degrees? The heart is apt to stop beating. Strangely enough, the colder the person becomes, the warmer he begins to feel. Most cases of hypothermia develop in air temperatures between 30 and 50 degrees, which doesn't sound cold but when you're wet and the wind's blowing, it can feel downright frigid. Hypothermia is "The killer of the unprepared" so — BE PREPARED!

When on the flightline during the winter months keep in mind the particular hazards of the season. If the temperatures warrant, get a heater to the aircraft for the preflight. Should a significant delay be encountered before engine start, consideration should be given to waiting out the delay in a nice warm location — Base Ops or the squadron building — just keep the controlling agencies aware of your location. Your crew will appreciate the concern and their performance will be up to normal standards as well.

Hopefully, you can now recognize and handle some of the stresses of our profession which occasionally have a way of detracting from the exhilaration and enjoy-

ment of flight. Realize that there will be days that stress will overwhelm even the best of us and those are the days when you should look to others — no man is an island. Stress comes from all directions — inside and out — remember, control what you can (relaxation, diet, dress for the season, etc) and don't worry about the rest. The excitement you feel when flying is too precious to cloud over. You've earned your wings — so FLY! And remember —

"Because I fly, I laugh more than other men,
I look up and see more than sky,
I know how the clouds feel,
what it's like to have the blue in my lap,
To look down on birds,
to feel freedom in a thing called the stick —
Who but I can slice between God's billowed legs,
and feel them laugh and crash with his step?
Who else has seen the unclimbed peaks?
The rainbow's secret?
The real reason birds sing?
Because I fly, I envy no man on earth."



The SAC Safety Screen is an honor roll of SAC's most professional crews. To gain listing on the Screen, crew members must be nominated by their unit commanders and meet high selection criteria of experience in their aircraft or missile system IAW AFR 127-2/SS1

305 AREFS, Grissom Crew E-131: P Maj Rex E Schlagenhauf, IP Maj James N Gabriel, CP Capt Michael P Gee, N Capt Leslie M Hausse, BO A1C Stephen W Miller

310 AREFS, Plattsburgh Crew E-162: P Capt John Green, CP 1Lt Mike Albrecht, N Capt Steve Fulton, BO Sgt Robert Edgett

91 AREFS, McConnell Crew E-110: P Maj David B Anderson, CP Capt Lenuie Gilchrist Jr, N Capt James D Sanders, BO SSgt Marc D Aalderink

384 AREFS, McConnell Crew E-157: P Capt Francis M Privett, CP 1Lt David W McSwain, N 1Lt Anne R Randolph, IBO SSgt Terry A Ross

644 BMS, K I Sawyer Crew S-01: FP Maj Michael Miller, CP 1Lt Jeffrey Luellen, RN Maj Gerald Kasten, NN 1Lt Michael Hayden, NE Capt Harry Bender, AG TSgt David Lloyd

644 BMS, K I Sawyer Crew S-02: FP Capt William Hemmens, CP 1Lt Craig Sutton, RN Capt James Ford, NN Capt Carl Shoemaker, NE Capt Richard Mayer, AG TSgt Robert Neitz

46 AREFS, K I Sawyer Crew E-113: P Capt Mark W Neice, CP 2Lt John G Allen, N Capt Brenda S Whitmer, BO SSgt George E Collins

46 AREFS, K I Sawyer Crew E-112: P Capt Stephen W Voight, CP 1Lt William A Nichols, N 1Lt Stephen M Wade, BO SSgt Jeffrey A Stewart

22 AREFS, March Crew E-140: IP Maj Charles W Conrad, CP 2Lt Peter G Smith, NN 1Lt Eric D Karge, BO Sgt Laurie A Kent

22 AREFS, March Crew R-122: FP Capt Timothy J Schmidt, CP 1Lt Michael D Jones, NN 2Lt Bruce A Prentice, IB SSgt Frank DeJauregui

7 AREFS, Carswell Crew R-126: FP Capt Martin Breindenstein, CP 1Lt Paul A Nelson, NN 1Lt Warren M Lucky, BO Sgt Donald R Hess

9 BMS, Carswell Crew R-61: AC Capt Norman R Briscoe, CP 1Lt Mark T Dietsch, RN Capt John M Bruce, N 2Lt Matthew E Hughes, EW 1Lt Leonard S Moskal, G SSgt Jim A Griffith

917 AREFS, Dyess Crew R-121: P Capt John C Fobian, CP Capt Mary Melley Blissard, N Capt Timothy G Vaughan, BO SSgt Bruce S Grattie

20 BMS, Carswell Crew S-23: AC Maj Walter C Hill, CP 1Lt Leslie W Moreland, RN Capt Richard A Palmer, N Capt Barry T Marquart, EW 1Lt Gary S Wright, G SSgt Alan D Hotaling

380 BMW, Plattsburgh Crew R-07: P Maj Larry E Fisher, N Maj William H Pecsok

380 BMW, Plattsburgh Crew R-61: P Maj Paul E Murr, N Capt Bradley L Moffett

46 BMS, Grand Forks Crew S-02: P Maj Roger J Mertes, CP Capt Patrick L Travnicek, RN Capt David J Grenda, N 1Lt Robert A Deivert, EW Capt George M Luker, G SSgt Gerald M Juniper

905 AREFS, Grand Forks Crew E-123: P Capt Kip K Stangl, CP 1Lt Alton L Self Jr, N 1Lt Richard D Bonner, BO TSgt Thomas S Dewitt

320 BMW, Mather Crew S-10: P Maj Quincy Sharp, CP Capt Michael D'Asta, CP 1Lt James A Ciabattoni, RN Capt Bruce Lasater, RN Capt Fredrick D Van Wicklin, EW 1Lt Robert E Kerr, AG SSgt Robert K Ratcliffe

320 BMW, Mather Crew R-117: P Capt Terrence D Lakin, CP 1Lt Michael W Agee, NN 1Lt Grant E McMillin, BO SrA Gregory C Conrad

337 BMS, Dyess Crew E-11: P Capt Randolph Remorenko, CP Capt Richard B Witt, RN Lt Col Robert A Hudson, N 1Lt Samuel H Metzler, EW Capt Kevin S Sabicer, AG Sgt Michael L Simmons

93 AREFS, Castle FTC Crew: IP Maj John M Stancil, IP Capt James J Garrity, IN Lt Col James W Steinmann Jr, IBO TSgt Donald L Houchin

341 SMW, Malmstrom Crew R-026: MCCC 1Lt David T Cheatham, DMCCC 2Lt Charles R Dubuc

91 SMW, Minot Crew E-011: MCCC Capt James Faircloth, DMCCC 2Lt Donald Saunders

6 SW, Eielson Crew S-03: IP Maj Michael H Rayburne, CP Capt Arpad E Horvath, N-1 Capt Anthony J Rocco Jr, N-2 Capt Roger I Ross

6 SW, Eielson Crew E-14: TC Maj Michael G Smith, R-1 Capt Richard G Brown, R-2 Capt Robert Dixon Jr, R-4 Capt Steven E Schafer, MT Capt Mark F Wilmes, PT SSgt Kenneth A Getsee Jr, ET SSgt William D Pickle

FLARE



"Because I fly, I laugh more than other men,
I look up and see more than sky,
I know how the clouds feel,
what it's like to have the blue in my lap,
To look down on birds,
to feel freedom in a thing called the stick —
Who but I can slice between God's billowed legs,
and feel them laugh and crash with his step?
Who else has seen the unclimbed peaks?
The rainbow's secret?
The real reason birds sing?
Because I fly, I envy no man on earth."